

**Meeting Agenda**  
**Governor's Drought and Water Supply Advisory Committee**  
**Thursday, September 15, 2016, 9:00 a.m.**  
**Room 152 Capitol Building**

<b>9:00</b>	<b>Welcome – Chair Lt. Governor Mike Cooney</b>
<b>9:05</b>	National Weather Service – Climate Summary, Forecasts <b>Don Britton</b> , National Weather Service, Great Falls
<b>9:15</b>	NRCS – Mountain Precipitation, Surface Water Supply Outlook <b>Lucas Zukiewicz</b> , Snow, Water, and Climate Services, Bozeman
<b>9:25</b>	U.S. Geological Survey - Montana Streamflow Update <b>USGS Representative</b> , USGS Science Center, MT / WY Office, Helena
<b>9:35</b>	Montana DNRC – Wildfire Season Update <b>DNRC Representative</b>
<b>9:45</b>	National Agricultural Statistics Service - Crop Report and Soil Moisture <b>Eric Sommer</b> , State Statistician
<b>9:55</b>	USDA Farm Service Agency – Assistance Programs Update <b>Michelle Edwards</b> , Program Specialist
<b>10:00</b>	Report on City of Bozeman Drought Management Plan <b>Lain Lioniak</b> , Water Conservation Specialist, City of Bozeman
<b>10:10</b>	Report on Water Conservation Measures and Impacts to Agriculture <b>Walt Sales</b> (or representative), Association of Gallatin Agricultural Irrigators (AGAI)
<b>10:20</b>	Montana Water Supply and Moisture Status by County Map <b>Ada Montague</b> , DNRC Staff
<b>10:25</b>	Agency Impact Assessment Summaries and Discussion on Drought Status <b>Chair Lt. Governor Mike Cooney</b>
<b>10:35</b>	Summary of Drought Forums and Next Steps on Updating Drought Response Plan <b>Ada Montague</b> , DNRC Staff
<b>10:40</b>	Establish Working Group for Drought Plan Update <b>Chair Lt. Governor Mike Cooney</b>
<b>10:50</b>	<b>Announcements / Public Comment</b>
<b>11:00</b>	<b>Adjourn</b>

**Last Meeting for Water Year 2016**

A work session will be held on October 19<sup>th</sup> from 10 am – noon at the DNRC Ted Doney Conference Room, 1424 9<sup>th</sup> Ave., Helena, to discuss the update of the Montana Drought Response Plan.

# STILLWATER COUNTY DROUGHT ADVISORY MEETING

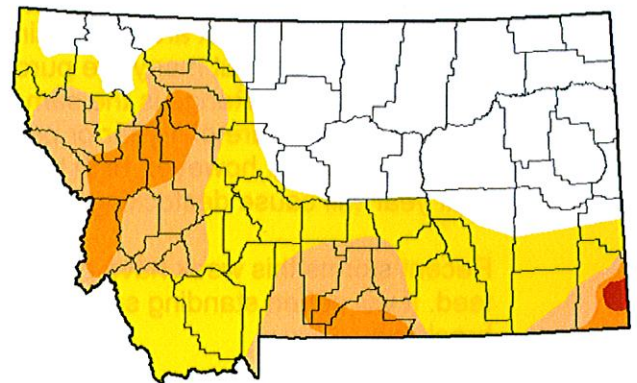
9/1/2016

## Minutes.

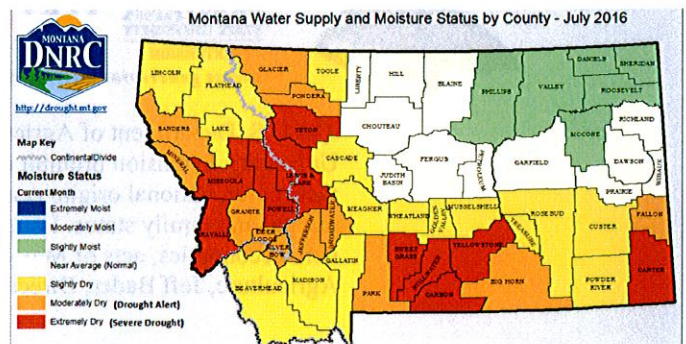
Called to order 3:30 PM

### Announcements

- ☐ Governors Drought Advisory meeting in Billings
  - September 7, 3-4:30pm Billings Public Library 510 N. Broadway
  - The Governor's Drought and Water Supply Advisory Committee, wants input from local communities on steps the state can take to help them prepare for and respond to drought. Cooney and the Committee are in the process of updating the State's current Drought Response Plan
  - State Drought Meeting September 15<sup>th</sup> Helena
- ☐ Update of current situation.
  - Local level:
    - NRCS
    - FSA
- ☐ How can we Prepare for Continued Drought?
  - ☐ Discussed
- ☐ Other items of interest
  - Montana Climate Office- Kelsey Jensco, Nic Silverman Putting in about 20 stations throughout montana with soil moisture. Also some remote sensing
  - National Soil Moisture Network – Met in may there should be a lot of useful tools come from that group in the near future
  - CoCoRAHS The Community Collaborative Rain, Hail and Snow Network
  - Stillwater's Weather Stations



What are the conditions out there? (Reverse Side)



## Conditions update from across County as of 9-1-2016

Average of 10 sites around the county.

	Spring	Winter	Range	Dryland	Irrigated	Stock	Ground	Other
	Wheat	Wheat		Hay	Hay	water	Moisture	Crops
	% normal	% normal	% normal	% normal	% normal	% normal	% very short	% normal
South area	50	90	50-70%	30-40%		30-50%	90	
North area	70	90	30-50%	5-25%		30-50	95	

### Comments:

Cattle movement is 1-2 months ahead. Are using reserves and winter pasture as of September 1. Consensus is listed in the averages above. Other contributing factors include stock water springs and wells drying up or low flow making pastures use difficult because of poor distribution or at most unusable. Also the grass is dry and brittle. Much of the grass is being lost do to trampling and breaking off. Many are hauling water. Some reports of cattle coming off the range 2-3 months early. Most are purchasing an additional amount of hay. There was good carryover of hay from last year but many are purchasing considerable percent of what was needed from this year's production. Range is the same way. Most producers have reserves built into their grazing systems to take care of 1 year or poor conditions. They will make it through this year with out much destocking, however, high hay prices and continued poor conditions at the beginning of next year will cause destocking and extreme hardship.

Recent storms this week have brought good moisture, however it may be too late to help with fall feed. It will soften standing senesced grasses and that will help with plant trampling and breakage.

Respectfully submitted

*Lee Schmelzer*

Stillwater County Extension Agent

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*As always, please do not hesitate to contact me with further questions.*



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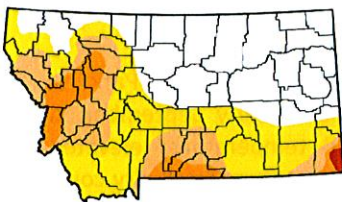
# Montana Water Supply Monthly Report: September 2016



## Summary

This report provides an overview of conditions since the last Montana Water Supply Monthly Report from August, 2016. A variety of sources make up this report, each with different timeframes of reporting. Be sure to pay attention to the date the information was made available to get the most accurate assessment of conditions. Montana continues to experience a mix of water supply conditions. In general, conditions in the Southwest have gotten drier, and drought persists in the southcentral part of the state. The area to the west of the divide has seen moderate improvement thanks to summer rains and lower river temperatures, while the Northeast is drying.

## U.S. Drought Monitor Montana



September 6, 2016  
(Released Thursday, Sep. 8, 2016)  
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	C2-D4	D3-D4	D4
Current	43.00	57.00	24.33	3.08	6.48	0.00
Last Week 9/20/16	43.00	57.00	24.33	7.60	8.36	0.00
1 Month Ago 8/19/16	77.41	22.59	7.62	3.00	8.00	0.00
Start of Calendar Year 1/1/2016	48.55	51.45	30.33	20.95	3.54	0.00
Start of Water Year 9/1/15	30.55	69.45	38.18	28.78	16.92	0.00
One Year Ago	29.21	71.79	38.59	28.91	10.84	0.00

Intensity:  
D0 Abnormally Dry  
D1 Moderate Drought  
D2 Severe Drought  
D3 Extreme Drought  
D4 Exceptional Drought  
D5 Catastrophic Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for regional information.

Author:  
David Sinner  
Western Regional Climate Center



<http://droughtmonitor.unl.edu/>

## US Drought Monitor:

A small area of D2 (Severe) to D3 (Extreme) drought was observed in Southeastern Carter County on August 23<sup>rd</sup>. Severe drought conditions were also observed along the Beartooth Foothills. About 0.35% of Montana was observed to be in D3 or greater drought which is slightly less than July 2016. The remainder of south central and southeast Montana is in no drought to moderate drought.

## Montana Water Supply Assessment:

The area of Severe Drought was reduced along the Rocky Mountain Front and west of the Continental Divide, though all these areas remain in a Drought Alert and could experience drought impacts if rain and cool temperatures do not continue.

While conditions are not as severe in western Montana, Granite, Powell, and Deer Lodge counties received below normal precipitation in August. Field reports indicate irrigated pasture is suffering due to lack of subsoil moisture and many creeks are no longer flowing. High elevation springs are dry or barely producing. Springs in high elevations are locally supported "spill points" for small alluvial systems or fractured rock aquifers. These springs will be sensitive to decreases in recharge and because the aquifers have little storage, will be the first to go dry.

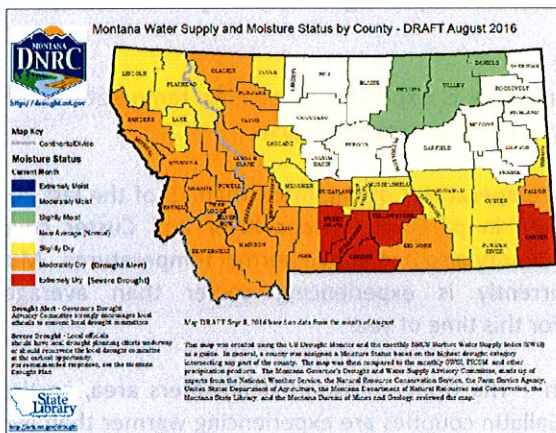
The Southwest part of the state is increasingly dry, notably Beaverhead, Madison, Gallatin, and Park counties were changed from slightly dry to moderately dry.

Northeast Montana is drying out following a summer of above average precipitation. Western North Dakota is beginning to show signs of drought across the border from Sheridan, Roosevelt, and Richland counties.

The Southcentral and Southeast continue to be very dry. Wibaux County reported that producers are watching for aborted calves and are selling open (nonpregnant) cows and heifers. Wheatland County reported dry conditions, particularly in the northwest corner. Several producers are weaning and selling calves about two weeks early to mitigate pasture losses. The ability to purchase hay to offset lost production is also a concern in both counties.

Source:

<http://droughtmonitor.unl.edu/Home/StateDroughtMonitor.aspx?MT>

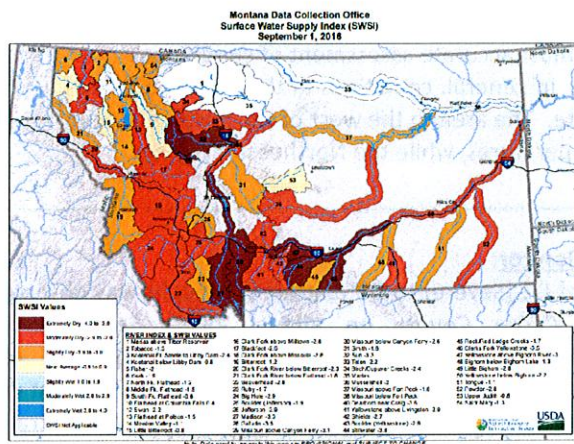


Source:

<https://mslservices.mt.gov/Geographic Information/Maps/drought/>



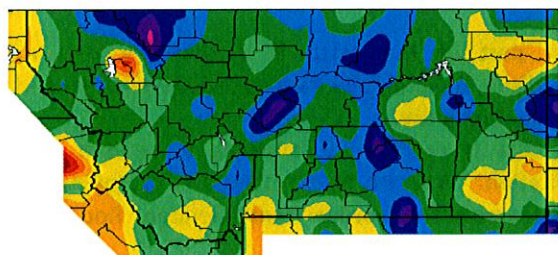
# Montana Water Supply Monthly Report: September 2016



Source:

<https://mslservices.mt.gov/geographic-information/maps/watersupply/Statewide/StatewideSWSI>

Avg. Max. Temperature dep from Ave (deg F)  
8/13/2016 - 9/11/2016



Generated 9/13/2016 at WRCC using provisional data.  
NOAA Regional Climate Centers

Source: <http://www.wrcc.dri.edu/anom/>

## Surface Water Supply Index (SWSI):

Water shortages persist throughout the state with conditions in the Southwest worsening from slightly dry to moderately dry.

Upper Missouri – Recent precipitation along the Rocky Mountain Front has not had much impact and conditions remain dry along the Missouri. The Sun River is currently at a -3.3 SWSI and continues to set all-time record lows for the period of record. Greenfields Irrigation District (GID) stopped deliveries around the second week of August. The Beaverhead, Big Hole, Jefferson, Madison, and Gallatin basins all show increasingly dry conditions.

Lower Missouri – Although most of the summer was unusually wet for the northeast, the climate appears to be drying and becoming more typical for this time of year. Choteau and Blaine counties received above normal in precipitation in August.

Yellowstone – Water conditions from Gardiner Park to the Yellowstone near Livingston improved in early September, though river flows continue to be low and temperatures elevated. The Bighorn River remains a mix of moderate to extremely dry conditions, despite well-above normal precipitation for August in the southeast part of the state.

Clark Fork/Kootenai – Western Montana experienced below normal precipitation in the month of August. Ravalli County was an exception and appeared to improve, but was 1 inch short prior to August rains. Lolo Creek is dry for the second year in a row. The North Fork of the Blackfoot appears to be improving as river temperatures drop.

## Temperatures:

The state as a whole is experiencing cooling temperatures after a warm end of July and beginning of August.

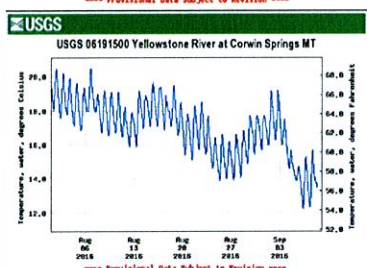
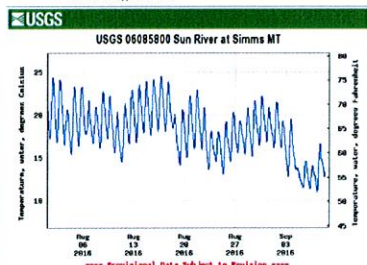
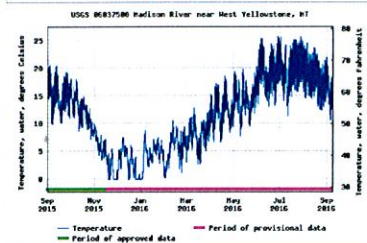
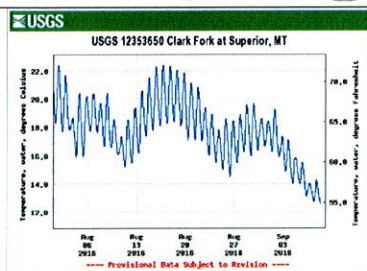
Yellowstone – Temperatures during more than 15 of the last 30 days were above 90°F in parts of Powder River and Custer counties. Southern Park County also had above normal temperatures. Much of the basin currently is experiencing cooler than average air temperatures for this time of year.

Upper Missouri – The Upper Missouri Headwaters area, particularly Madison and Gallatin counties are experiencing warmer than average temperatures for this time of year. On the whole the basin is looking normal.

Lower Missouri – The Northeast, particularly Richland and Roosevelt counties, is beginning to warm up and dry out, but the majority of the basin continues to be cool and wet.

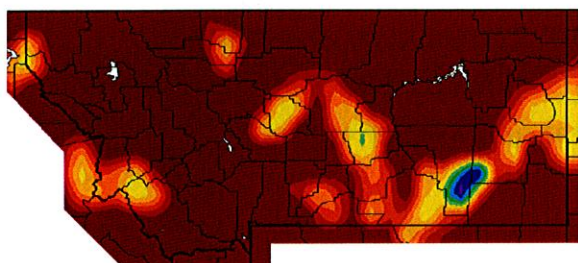


# Montana Water Supply Monthly Report: September 2016



Source: <http://waterwatch.usgs.gov/?m=real&r=mt>

Precipitation # Days > 1.00"  
8/13/2016 - 9/11/2016



Generated 9/12/2016 at WRCC using provisional data.  
NDAA Regional Climate Centers

Source: <http://www.wrcc.dri.edu/anom/>

Clark Fork/ Kootenai – Although dry conditions in Idaho may impact southern Ravalli, Lincoln, and Sanders Counties, the basin as a whole is cooling. The notable exception is an area of warmer temperatures in northwestern Lake and southwestern Flathead counties.

## River Temperatures:

Clark Fork/ Kootenai – River temps have declined significantly since about August 20, 2016. While many rivers remain status quo, a few of note are listed here.

Upper Missouri – Stream temperatures in the Upper Missouri basin are mostly in normal ranges for this time of year. Exceptions are warm, but cooling, temperatures in the Madison near West Yellowstone and a strong cooling trend in the Sun River. The Madison near West Yellowstone is showing a slightly less significant decline in river temps, but they are going down.

Yellowstone - The Yellowstone at Corwin Springs has showed a decline in river temperatures since about 9/3/2016.

## Precipitation:

Although precipitation has increased statewide, areas that have had days of one inch or more of rain are limited. Without significant rainfall the state will continue to face the consequences of two years of average to below average snow packs coupled with early runoff and low summer rainfall.

Yellowstone – Southeastern Rosebud County benefitted the most from recent rain events, receiving in excess of 1-2 inches of rain. Wibaux, Dawson, Prairie, and Custer Counties also saw about an inch of rain in the last 30 days.

Upper Missouri – Northeastern Beaverhead County received an inch or more of rain in the last 30 days, as well as parts of Pondera and Toole Counties.

Lower Missouri – Judith Basin, Fergus and parts of Petroleum, and a small pocket of Musselshell County received in excess of one inch of rain in the last 30 days.

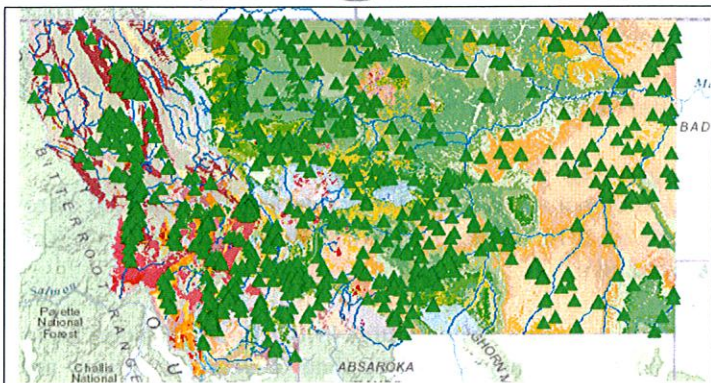
Clark Fork/ Kootenai – Ravalli, Lincoln, and Sanders counties all saw in excess of one inch of rain over the last thirty days.

## Groundwater:

Areas feeling the effects of low surface water may be turning more to groundwater resources to meet demand. There has been an increase in stockwater well report requests from the NRCS field offices. However, most of the observed declines are likely from decreasing recharge from precipitation and, eventually, shortages of irrigation water in the western basins and alluvial aquifers. Areas to watch are



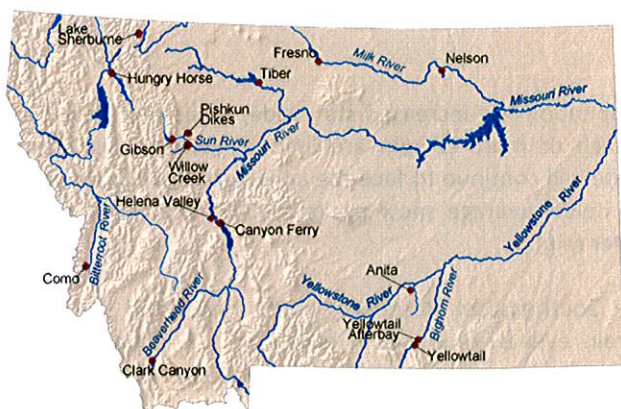
# Montana Water Supply Monthly Report: September 2016



This is a screenshot of the Montana Bureau of Mines and Geology Interactive Map of groundwater resources, a useful tool to learn more about wells and groundwater in the state.

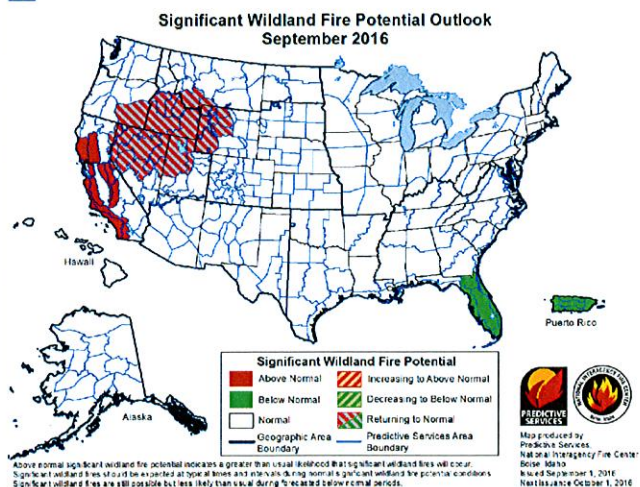
Source:

[http://www.mbmgs.mtech.edu/gwip/gwip\\_reports.asp](http://www.mbmgs.mtech.edu/gwip/gwip_reports.asp)



Source:

[http://www.usbr.gov/gp/lakes\\_reservoirs/montana\\_lakes.html](http://www.usbr.gov/gp/lakes_reservoirs/montana_lakes.html)



the Rocky Mountain Front and the Blacktail Deer Creek area south of Dillon.

Upper Missouri – Water levels in a monitoring well at the Augusta High School (GWIC Id: 7458, with 89 measurements dating from 1994) have declined about 2 feet since 2010. This well monitors water levels in a sand and gravel aquifer and the slow decline represents lessened recharge from precipitation or irrigation practices. Water levels in the heavily irrigated Blacktail Deer Creek area south of Dillon are falling since peaks in 2011. Water levels in monitoring well 126663, with record from 1991, have fallen about 20 feet, but remain above record lows seen in 2004. Water levels in some developed areas of the Madison Valley are declining. Water levels in the Gallatin Valley are mostly sustained by irrigation practices and are currently little changed.

There are no significant water-level changes to report in the Lower Missouri, Yellowstone, and Clark Fork/Kootenai basins.

## Reservoirs:

Reservoirs around the state are for the most part normal with a few notable exceptions.

Upper Missouri – Gibson Reservoir is at 19-25% of average and is at a slightly lower capacity than this time last year. Pishkun is at 21% of average.

Lower Missouri – Although Nelson Reservoir is at 49% of average for this time of year, the low average is caused by construction.

## Wildfire Forecast:

Currently there are five active major wildfires burning in Montana, ranging from 600-28,000 acres in size.

Clark Fork/Kootenai –

Copper King Fire (28,553 acres) east of Thompson Falls.

Roaring Lion Fire (8,658 acres) west of Hamilton.

Observation Fire (1,422 acres) southwest of Hamilton.

Upper Missouri –

Nez Perce Fire (687 acres) northeast of Butte.

Yellowstone –

Harris Fire (3,394 acres) southwest of Birney.

Throughout the northern Great Basin, including portions of the northwest, Northern Rockies, and Rocky Mountain Areas elevated wildfire risk will transition to normal conditions by the end of September. Normal conditions indicate minimal fire activity. Occasional dry cold fronts during September and possibly October will



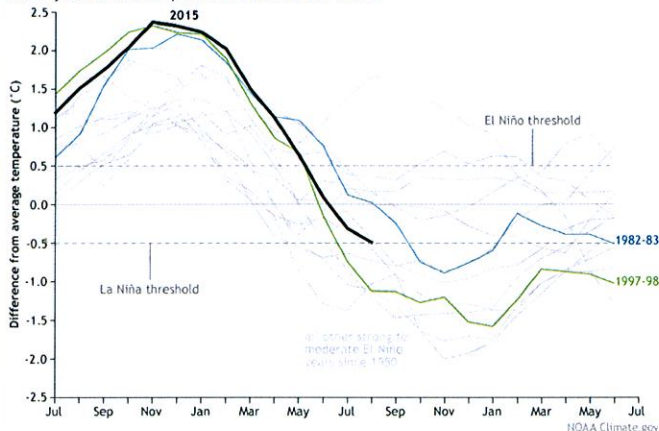
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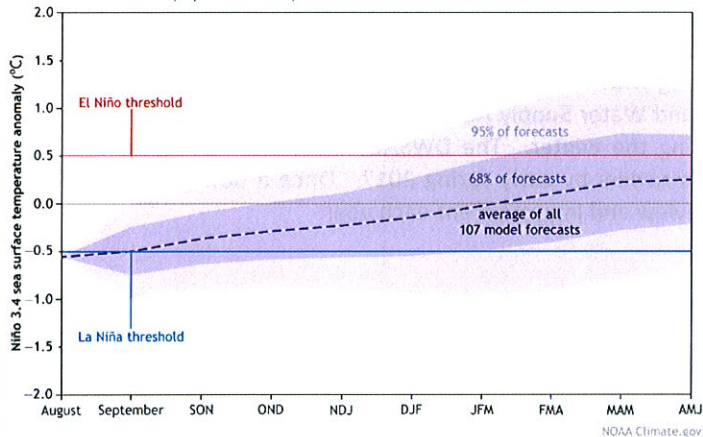
Source:

<http://www.predictiveservices.nifc.gov/outlooks/outlooks.htm>

Monthly sea surface temperature Niño 3.4 Index Values

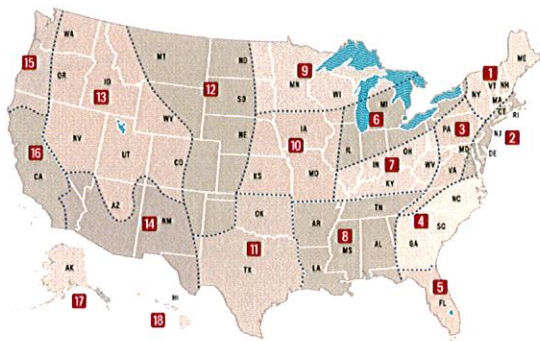


NMME model forecasts (September 2016)



Source: [https://www.climate.gov/news-](https://www.climate.gov/news-features/blogs/ensio/september-2016-ensio-update-cooling-our-heels)

[features/blogs/ensio/september-2016-ensio-update-cooling-our-heels](https://www.climate.gov/news-features/blogs/ensio/september-2016-ensio-update-cooling-our-heels)



Source: <http://www.almanac.com/weather/longrange>

present the potential for large fires on the landscape to grow rapidly; however, these conditions will be short followed by opportunities for successful firefighting efforts.

## Weather and Climate Forecast:

The outlook for the coming winter is uncertain. The general consensus is that temperatures will be lower while precipitation will be slightly above average.

The El Niño-Southern Oscillation (ENSO) shows neutral conditions for the next few seasons. Sea surface temperatures (SST) near the equator influence weather patterns that can either introduce an El Niño (warmer and drier weather for Montana) or a La Niña (cooler and wetter weather for Montana). Current monthly SST appear to mimic a La Niña pattern, however, it is also important to determine whether the SST will stay below the threshold for the next several overlapping seasons. Currently the answer is the SST will not stay below the La Niña threshold.

The Farmer's Almanac offers the following forecast:

## East of the Divide:

September 2016 – temperature 59° (2° below avg.); precipitation 2.5" (1" above avg.); Sep 1-6: Sunny, warm; Sep 7-16: Rainy periods, chilly; Sep 17-22: Showers, cool north; sunny, warm south; Sep 23-25: Rain and wet snow north, showers south; Sep 26-30: Sunny, mild.

October 2016 – temperature 47° (2° below avg.); precipitation 1.5" (0.5" above avg.); Oct 1-6: Sunny, nice; Oct 7-11: Rain and snow, chilly; Oct 12-18: Sunny, turning mild; Oct 19-27: Snowstorm, then sunny, cold; Oct 28-31: Flurries, cold.

November 2016 – October 2017: Winter will be colder than normal in the north, warmer in the south. The coldest periods will be in early and late December and early and mid- to late January. Precipitation will be slightly above normal in the north and below normal in the south. Snowfall will be above normal in the north and below normal elsewhere, with the snowiest periods in late November, mid- to late December, and mid- to late February. April and May will be warmer than normal, with precipitation a bit above normal. Summer will be cooler than normal, with slightly below-normal rainfall. The hottest periods will be in early July and early and mid- to late August. September and October will have near-normal precipitation, with temperatures below normal in the north and near normal in the south.

## West of the Divide:

September 2016 – temperature 59° (3° below avg.); precipitation 1" (avg.); Sep 1-6: Sunny, warm; Sep 7-17: Scattered showers, cool; Sep 18-22: Showers, cool; Sep 23-25: Rain and snow, chilly; Sep 26-30:



# Montana Water Supply Monthly Report: September 2016



	<p>Sunny, turning warm.</p> <p>October 2016 – temperature 47° (4° below avg.); precipitation 1.5" (avg. north, 1" above south); Oct 1-5: Sunny, nice; Oct 6-8: Showers, north, sunny south; Oct 9-16: Showers north; snow, then sunny; Oct 17-19: Showers north, snow south; Oct 20-22: Sunny north, snowstorm south; Oct 23-31: Snow, then sunny, cold.</p> <p>November 2017 to October 2017 – winter temperatures will be above normal, with precipitation a bit below normal. The coldest periods will be in early and mid- to late December and mid- to late January. Snowfall will be above normal in the north and below normal elsewhere, with the snowiest periods in late November, early and mid-December, and mid-January. April and May will be slightly warmer and drier than normal. Summer will be slightly hotter than normal, with near-normal rainfall. The hottest periods will be in late June and early to mid- and mid- to late July. September and October will be cooler than normal, with above-normal precipitation.</p>
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## Update on State Drought Plan Update:

The Lt. Governor completed the last of four Community Drought Forums on September 12, 2016. The feedback from these meetings will be summarized and made public along with a draft outline for the updated plan by the end of October for additional public comment. The Drought and Water Supply Advisory Committee (DWSAC) will select a Working Group to oversee the update process during the winter. The DWSAC anticipates having an updated Drought Management Plan ready for the Governor's review by early spring 2017. Once a new plan is adopted, the DWSAC anticipates an iterative process of plan review and improvement each year.

## Resources:

- DNRC/Water Court Enforcement Projects: <http://dnrc.mt.gov/divisions/water/adjudication/water-distribution>
- National Drought Resiliency Partnership August 2016 Report: <http://www.usda.gov/documents/ndrp-august-2016-report.pdf>
- Current Conditions Maps (updated hourly/daily): <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mt/snow/products/?cid=nrcseprd1137464>
- USDA Drought Programs and Assistance: [http://www.usda.gov/wps/portal/usda/usdahome?contentidonly=true&contentid=usda\\_drought\\_programs.html](http://www.usda.gov/wps/portal/usda/usdahome?contentidonly=true&contentid=usda_drought_programs.html)
- Montana Drought Website: [www.drought.mt.gov](http://www.drought.mt.gov)